



DEPARTMENT OF TRANSPORTATION  
MATERIALS TRANSPORTATION BUREAU  
WASHINGTON, D.C. 20590

48668

DEPARTMENT OF TRANSPORTATION

Research and Special Programs  
Administration, Materials  
Transportation Bureau

49 CFR Parts 173 and 179

[Docket No. HM-175]

Shippers: Specifications for Tank Cars

**AGENCY:** Materials Transportation Bureau, Research and Special Programs Administration (the Bureau), Department of Transportation (DOT).

**ACTION:** Advance notice of proposed rulemaking (ANPRM).

**SUMMARY:** In an effort to reduce the risk of puncture or rupture of existing DOT Specification 105 tank cars in an accident environment, the Bureau is considering development of proposed regulations to require retrofitting DOT 105 tank cars to meet the puncture and thermal protection levels currently specified for DOT Specification 112 and 114 tank cars. The Bureau is also considering development of proposed regulations for puncture and thermal protection applicable to other existing and new DOT Specification tank cars that carry the same hazardous materials as 105 tank cars.

**DATE:** Comments must be received on or before October 16, 1980.

**ADDRESS:** Comments should be addressed to the Dockets Branch, Materials Transportation Bureau, U.S. Department of Transportation, Washington, D.C. 20590. Comments should identify the docket number and notice number and be submitted in five copies. The Dockets Branch is located in Room 8426 of the Nassif Building, 400 Seventh Street, SW., Washington, D.C. Public dockets may be reviewed between the hours of 8:30 a.m. and 5:00 p.m., Monday through Friday.

**FOR FURTHER INFORMATION CONTACT:** Leavitt A. Peterson, Office of Safety, Federal Railroad Administration, Washington, D.C. 20590, (202) 426-0897.

**SUPPLEMENTARY INFORMATION:** The Bureau and the Federal Railroad Administration (FRA) feel that previously completed regulatory actions for DOT Specification 112 and 114 tank cars together with regulatory actions now in process for DOT Specification 105 tank cars will

significantly alleviate the consequences of major accidents involving hazardous commodities. Thus far, there has been no recorded accident in which the HM-144 mandated puncture or thermal protection systems have failed. Nevertheless, these safety improvement actions and proposed actions have not directly addressed several safety concerns in the total system of rail transport of hazardous commodities.

The Bureau and FRA now propose to collect additional information which will allow a comprehensive evaluation of the need, means, and cost to:

1. Extend the specified puncture and thermal protection levels of DOT Specification 112 and 114 tank cars (HM-144) to existing DOT Specification 105 tank cars that transport the same commodities as 112 and 114 tank cars;

2. Extend the specified puncture and thermal protection levels of DOT Specification 112 and 114 cars (HM-144) to existing DOT Specification 105 tank cars that transport other hazardous commodities such as ethylene oxide, butadiene, poisons, and combustible and flammable liquids or solids.

3. Extend the specified puncture and thermal protection levels of the DOT Specification 112 and 114 tank cars (HM-144) to other new and existing DOT Specification tank cars that carry the same commodities as DOT Specification 105 cars, e.g., DOT Specification 111 tank cars.

The rules promulgated by the Bureau in HM-144 were formulated as performance standards, setting minimum levels of protection from impact and from fire for flammable compressed gasses and anhydrous ammonia carried in DOT Specification 112 and 114 tank cars. It can be argued that these performance standards should be the minimum standards for all tank cars carrying those products. It can be further argued that the same level of protection should be afforded for other equally hazardous commodities that pose a similar degree of risk. The Bureau and the FRA believe that the issues raised by these arguments need to be more fully explored and analyzed.

Unlike the DOT Specification 112/114 tank cars, the DOT Specification 105 tank cars cannot be treated as a uniform single group. They are composed of many sub-groupings which differ from each other in terms of shell and jacket thickness, insulating system properties, structural features, type and capacity of

pressure relief systems, fittings, pressure rating and amount of the various loadings they transport. Generally, the sub-groupings exist because each has been designed to accommodate a specific, rather narrow set of hazardous commodities. Even within each sub-grouping, there are differences in design due to evolutions over the past forty years or because of the exercise of manufacturing options.

Although 105 tank cars carry the same or equally hazardous commodities as 112 and 114 tank cars, some of the sub-group 105 tank car designs provide less puncture resistance and thermal protection than 112 and 114 cars. The deficiencies were acknowledged during the 112 and 114 regulatory proceedings and in subsequent hearings and testimony to Congress.

In a notice of proposed rulemaking (NPRM) published elsewhere in this issue of the *Federal Register*, the Bureau is proposing to require the equivalent tankhead and thermal protection specified for 112 and 114 tank cars in HM-144 to be provided on newly built 105 tank cars. The proposed rule would also require that shelf couplers be installed on all 105 tank cars by December 31, 1981, and installed on all other DOT specification tank cars by December 31, 1984. Retrofit of existing tank cars for tank head and thermal protection is covered by this notice.

While there does not appear to be any major technical obstacles to retrofitting those 105 cars which are identified as needing additional head and thermal protection, there may be unique problems in assessing the degree of protection now possessed when compared to the performance standards of HM-144 and the magnitude of economic burdens associated with retrofitting, retiring, or changing the usage of certain existing 105 cars.

This ANPRM contains several subject areas in which the Bureau and FRA are soliciting additional facts from the public, railroads, shipping industries, tank car builders, leasing companies, railroad operating unions, and other involved safety interest groups and associations. The additional information which is collected will be used in resolving the issues in retrofitting existing 105 cars and dealing with other DOT Specification cars which carry the same hazardous commodities.

The NPRM contains data on some major accidents in which DOT

Specification 105 cars have been involved. It is clear that several catastrophic accidents have occurred involving 105 cars and that both commodities covered under HM-144 and other hazardous commodities not covered under HM-144 have been released. Ethylene oxide and chlorine are examples of commodities that are not handled in 112 and 114 cars but pose a serious threat and have a documented accident history. In addition, DOT Specification 111 cars may also carry hazardous commodities, ethylene oxide for example. The Bureau is especially interested in obtaining more detailed information on major accidents related to 105 tank cars and other DOT Specification tank cars that carry the same hazardous commodities as 105 cars. Flammable compressed gases, anhydrous ammonia, chlorine, nitrosyl chloride, sulfur dioxide, sulfur fluoride, acrolein, pyrophoric liquids, metallic sodium, hydrofluoric acid, hydrocyanic acid, nitrogen tetroxide, motor fuel antiknock compounds, butadiene, cryogenic liquids and ethylene oxide are specific commodities for which data is desired. Specific written comments are requested for the following questions and topic areas.

1. Please provide details of accidents experienced with the commodities noted above according to DOT Specification car and sub-group tank car design characteristics.

- 1.1 Date of each accident.
- 1.2 Location—State, nearest terminal, milepost, operating railroad.
- 1.3 Summary narrative of significant events.
- 1.4 Deaths due to release of hazardous material.
- 1.5 Injuries due to release of hazardous material.
- 1.6 Dollar damage estimate.
- 1.7 People evacuated.
- 1.8 Times of significant events.
- 1.9 Car number(s).
- 1.10 ICC/DOT specification type of car(s).
- 1.11 Date built.
- 1.12 Type and thickness of jacket(s).
- 1.13 Type and thickness of insulation materials.
- 1.14 Thickness of tank head(s), lower and upper halves.
- 1.15 Thickness of tank shell(s).
- 1.16 Tank and jacketing materials—type(s) of steel.
- 1.17 Type(s) of underframe(s).
- 1.18 Capacities in U.S. gallons.
- 1.19 Lading(s).
- 1.20 Safety valve type(s).
- 1.21 Safety valve setting(s), PSIG (start to discharge and full opening).
- 1.22 Type of damage sustained:
  - 1.22-1 Head punctures (location).
  - 1.22-2 Shell punctures (location).
  - 1.22-3 Fittings.
  - 1.22-4 Rupture due to fire exposure.
  - 1.22-5 Burn hole.
  - 1.22-6 Crack initiation location and propagation.
  - 1.22-7 Amount of product released.
  - 1.22-8 Distance pieces hurled.
  - 1.22-9 Distance covered by vapor cloud.

The Bureau and FRA have estimated the protection levels of various sub-

2. How should the existing level of head and thermal protection be determined for the various sub-groups of 105 tank cars? For example, should a point value be given for each type and thickness of material?

3. What process should be employed to identify and mark each car in the fleet according to its level of head and thermal protection?

4. Is a different level of head and thermal protection needed for hazardous commodities other than those carried in 112 and 114 tank cars? If so, what level and why for the particular commodity? How should these selected cars be identified and marked?

5. Please comment on the degree to which the table is an accurate summary of the existing DOT 105 fleet in terms of the characteristics selected for grouping the cars, the number of cars in the sub-groups, and the protection level indicated.

6. Please provide a breakdown of 105 cars owned by you according to appropriate sub-groupings and characteristics as in the table. Please provide similar information for 105 cars used but not owned by you. Please identify the cars by reporting mark and car number.

Based on surveys and subsequent assessments, the Bureau and FRA believe that at least 8000 existing 105 tank cars that carry the same hazardous commodities as the 112 and 114 tank cars would have to be retrofitted to bring them up to level of protection reasonably equivalent to that prescribed in HM-144.

7. How many 105 tank cars owned by you would be (a) retired (b) displaced to other service, or (c) retrofitted if HM-144 performance levels for head and thermal protection were mandated?

8. What would be the reasons and economic consequences or retirement of certain cars in lieu of retrofitting? What consequences from changing the usage rather than retrofitting? Please provide specific information on the age and size of the cars which would be strong candidates for retirement or a change in usage.

9. What effect would your decisions to retire or change the usage of certain 105 tank cars have on new car procurements?

10. What is your assessment of the technical feasibility or retrofitting the various sub-groups of 105 cars and other DOT Specification cars that carry the same commodities as the 105 cars?

11. What is your estimate of the cost of retrofitting a given 105 car? Please specify the sub-group and relevant car characteristics (e.g., capacity) that you base your overall estimate upon and

identify the specific cost elements. identify the type of protection system employed for purposes of the estimate, e.g., spray on insulation or jacketed insulation. Finally, included a cost estimate for the out of service time and other cost factors not included above.

12. What should be the retrofit priorities and what time frames would be reasonable? Please specify the basis for your priorities and time periods.

13. Which of the current relief valves are adequate? To what degree can relief valves or discs be modified?

14. Are there any peculiar problems or impacts unique to your situation or due to the fact that you may be a small business?

Finally, there are several issues of more general applicability for which the Bureau and FRA are soliciting information.

15. What methods or processes should be utilized to determine that a given tank head or thermal protection system meets or exceeds a specific performance level?

16. What requirements, procedures, and methods should be utilized for car stencilling?

17. What should be the reporting requirements for monitoring the progress of any mandated retrofit program?

18. What operational changes might be considered in lieu of retrofitting (humping restrictions, train make-up requirements, dedicated train service, special routing, special inspection procedures, on-board detection systems, speed restrictions)?

(49 U.S.C. 1803, 1804; 49 CFR 1.53, App. A to Part I, and paragraph (a)(4) of App. A, Part 106)

**Note.**—The Materials Transportation Bureau has determined that this ANPRM will not have a major economic impact under the terms of Executive Order 12044 and DOT implementing procedures (44 FR 11034) nor an environmental impact which would require the preparation of an environmental impact statement under the National Environmental Policy Act (49 U.S.C. 4321 *et seq.*) A regulatory evaluation and an environmental assessment have been placed in the docket and are available for review. A copy of the regulatory evaluation may be obtained from the person listed as the contact person for further information.

Issued in Washington, D.C. on July 17, 1980.

Alan I. Roberts,

Associate Director for Hazardous, Materials Regulation, Materials Transportation Bureau.

[FR Doc. 80-21931 Filed 7-18-80; 8:45 am]

BILLING CODE 4910-60-M

Summary of Estimated Protection Provided by Broad 105 Car Classification Sub-Groupings

Broad Sub-Groupings	Major Commodity	Maximum Number of Cars	Description				Commodity Subject to HM-144 Requirement	Estimated Status <sup>1</sup>	
			Insulation	Jacket	Head	Total		Head	Thermal
A	Chlorine	5200	4" Urethane	2/16"+	13/16"+	15/16"+	No	2	1
B	Chlorine	2700	4" Cork	2/16"+	13/16"+	15/16"+	No	2	2
C	LPG	2600	2-4" G.F.	2/16"+	11/16"+	13/16"+	Yes	1	1
D	Anhydrous Ammonia	1300	2-4" G.F.	2/16"+	9/16"+	11/16"+	Yes (Head Only)	1	1
E	LPG & Anhydrous Ammonia	1600	2-4" G.F., Urethane, Styrofoam	8/16"-	9/16"+	17/16"	Yes	2	1
F	VCN & Other Compressed Gasses	3500	2-4" G.F.	2/16"+	9/16"+	11/16"+	Yes	1	1
G	VCN & Other Compressed Gasses	1100	2-4" Mineral Fiber	8/16"-	9/16"+	17/16"	Yes	2	2
H	Motor Fuel Anti-knock	1700	4" Cork	3/16"+	12/16"+	15/16"+	No	2	2
I	Ethylene Oxide	1000	2-4" G.F.	2/16"+	10/16"+	12/16"+	No <sup>2</sup>	1	1
J	Poisons A	250	4" Cork	2/16"+	14/16"+	16/16"+	No	2	2
K	Flammable Liquids & Solids	900	2-4" G.F.	2/16"+	10/16"+	12/16"+	No <sup>2</sup>	1	1
L	Other	2500	Various	Various			No <sup>2</sup>	1	1

<sup>1</sup> Compared to HM-144 Minimum Requirements:

1 = Significantly less protection than HM-144 requires.

2 = Reasonably equivalent to protection required under HM-144.

<sup>2</sup> Also carried in 111A tank cars.

BILLING CODE 4910-90-C

Key: LPG = Liquefied Petroleum Gas  
VCN = Vinyl Chloride Monomer  
G.F. = Glass Fiber